

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A method of producing an interpenetrating polymer network (IPN) comprising the steps of

- i) providing a silicone polymer composition,
- ii) providing one or more monomers for a polymer,
- iii) providing a solvent for the one or more monomers,
- iv) exposing said silicone polymer composition to said one or more monomers and said solvent to precipitate monomer within said silicone polymer composition and
- v) polymerizing said monomer to form an IPN,

wherein said solvent has a surface tension at the exposing step of about 15 mN/m or less, ~~such as about 10 mN/m or less, such as about 8 mN/m or less, such as about 6 mN/m or less, such as about 5 mN/m or less, such as about 0 mN/m.~~

2. (Currently Amended) A method of producing an IPN according to claim 1, wherein said solvent has a surface tension in liquid form of about 15 mN/m or less, ~~such as about 10 mN/m or less, such as about 8 mN/m or less, such as about 6 mN/m or less, such as about 5 mN/m or less.~~

3. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition comprises at least 10 %, ~~such as at least 20 %,~~

~~such as at least 40 %, such as at least 60 %~~ by weight of polymer having a backbone consisting of Si and O molecules.

4. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition comprises at least 10 %, ~~such as at least 20%, such as at least 40%, such as at least 60 %~~ by weight of polymer having a backbone consisting of Si molecules.

5. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition comprises at least 10 %, ~~such as at least 20 %, such as at least 40 %, such as at least 60 %~~ by weight of polysiloxane polymer.

6. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition comprises one or more polymers selected from the group consisting of dimethyl polysiloxan, methylphenyl polysiloxane, fluorosilicone rubber, silicone esters, polysiloxanes, polysilanes, chlorosilanes, alkoxysilanes, aminosilanes, polysilanes polydialkylsiloxanes, and polysiloxanes containing phenyl substituents, said polymers of the silicone polymer composition optionally being vinyl-functionalized and/or optionally being partially or fully fluorinated.

7. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition comprises up to 90 % by weight of non-silicone polymers or co-polymers, fillers and/or additives, said non-silicone polymers ~~e.g. being~~ thermoplastics or thermosets, ~~preferably and being~~ selected from ~~the group consisting of~~ polyolefins, polyesters, polyurethanes, polycarbonates, and polyvinyl polymers, said fillers

~~e.g. being particles or fibres e.g. in the form of minerals or organic fillers, preferably and~~
~~being selected from the group consisting of silica, metals, metal oxides, mixed metal oxides,~~
~~glass beads or and glass fibers, and additives e.g. being selected from the group consisting of~~
adhesion promoters for 2K-constructions, process and plasticizing oils, antioxidants and
pigments.

8. (Currently Amended) A method of producing an IPN according to claim 1,
wherein said silicone polymer composition is partially vulcanized, ~~such as up to~~
~~vulcanization degree (cross linking degree) of at least 50 %, such as at least 70 %, such as at~~
~~least 90 % or wholly, such as at least 96 %, such as at least 97 %, such as at least 98 %.~~

9. (Previously Presented) A method of producing an IPN according to claim 1,
wherein said silicone polymer composition is a vulcanized rubber.

10. (Currently Amended) A method of producing an IPN according to claim 1,
wherein said one or more monomers are dissolvable in said solvent when said solvent is in
liquid state, in gas state or in supercritical state, ~~said monomer preferable being dissolvable in~~
~~the solvent in its liquid and/or supercritical state.~~

11. (Currently Amended) A method of producing an IPN according claim 1, wherein
said one or more monomers comprise at least 1 % by weight, ~~such as at least 10 % by weight,~~
~~such as at least 50 % by~~ of one or more of the monomers selected from the group consisting
of silicone containing monomers ~~such as silanes, such as TEOS (tetraethylorthosilicate or~~
~~tetraethoxysilane) or chloro or alkoxy functional silanes, olefins such as ethylene, propylene,~~
styrene, vinylpyrrolidone, oxygen- and nitrogen-containing monomers ~~such as acrylie~~

~~derivatives, e.g. acrylic ester and acrylic acid, methacrylic acid and ester, urethanes, mono- and di-functional alcohols, carboxylic acids, amines, isocyanates, epoxides, aromatic compounds such as aromatics carrying substituents such as alkyl groups and sulfonated aromatics, aromatic resins, imadazol and imidazol derivatives, pyrazoles, quaternary ammonium compounds, polyurethane prepolymers and ~~expoxy~~ epoxy resins.~~

12. (Currently Amended) A method of producing an IPN according to claim 1, wherein said one or more monomers comprise at least 50 % by weight of vinylpyrrolidone.

13 (Previously Presented) A method of producing an IPN according to claim 1, wherein said one or more monomers comprise at least 50 % by weight of olefins.

14. (Previously Presented) A method of producing an IPN according to claim 1, wherein said one or more monomers comprise at least 50 % by weight of silanes.

15. (Previously Presented) A method of producing an IPN according to claim 1, wherein said one or more monomers are free radical polymerizable.

16. (Currently Amended) A method of producing an IPN according to claim 1, wherein the solvent is one or more hydrocarbons or carbon-containing compounds or a composition comprising hydrocarbons or carbon-containing compounds with a Hildebrand solubility of below 11, ~~preferably 8 or less~~, the silicone polymer composition ~~preferable~~ being exposed to the solvent in its supercritical state or near its supercritical state, where the term 'near its supercritical state' means that the total pressure is at least 10 bar.

17. (Currently Amended) A method of producing an IPN according to claim 1, wherein the solvent comprises one or more compounds from the group of C₁-C₁₂ hydrocarbons or carbon-containing compounds, ~~preferably C₁-C₄ hydrocarbons, more preferably selected from the group consisting of methane, ethane, propane, propene, isobutene, butane, butene, isobutene, methanol, acetone, N₂O and CO₂, more preferably the solvent comprises CO₂,~~ the silicone polymer composition being exposed to the solvent in ~~supererital~~ supercritical state.

18. (Currently Amended) A method of producing an IPN according to claim 1, wherein the solvent has a surface tension in liquid form of about 15 mN/m or less, ~~such as about 10 mN/m or less, such as about 8 mN/m or less, such as about 6 mN/m or less, such as about 5 mN/m or less,~~ the silicone polymer composition being exposed to the solvent while it is in one or more of its states liquid state, gas state and supercritical state.

19. (Currently Amended) A method of producing an IPN according to claim 18, wherein said solvent comprises at least 50 % ~~such as at least 75 %, such as at least 90 %~~ by weight of one or more of the components selected from the group consisting of CO₂, and N₂O and C₁-C₅ hydrocarbons, the solvent ~~preferably comprising at least 50 %, such as at least 90 %~~ by weight of CO₂.

20. (Currently Amended) A method of producing an IPN according to claim 1, wherein the solvent comprises a surfactant ~~preferably selected from the group of~~ anionic, cationic, non-ionic and amphoteric surfactants, said solvent ~~prefably comprising up to 5 % by weight, such as between 0.001-50 grams of surfactant per kg solvent.~~

21. (Currently Amended) A method of producing an IPN according to claim 1, wherein a radical starter is incorporated into said silicone polymer, ~~preferably~~ by physical compounding, by swelling or impregnation in dissolved condition, or by co-impregnation with the one or more monomers, the amount of radical starter ~~preferably~~ being sufficient to initiate the polymerization.

22. (Currently Amended) A method of producing an IPN according to claim 1, wherein said one or more monomers are dissolved in the solvent together with a radical starter, the amount of radical starter ~~preferably~~ being sufficient to initiate the polymerization.

23. (Currently Amended) A method of producing an IPN according to claim 21, wherein the amount of radical starter is at least 0.01 mol % of the monomer, ~~such as at least 0.01 mol % of the monomer, such as at least 0.1 mol % of the monomer, such as at least 0.5 mol % of the monomer, such as at least 1 mol % of the monomer, such as between 1 and 10 mol % of the monomer.~~

24. (Currently Amended) A method of producing an IPN according to claim 21, wherein said radical starter is selected from ~~the group consisting of peroxides, such as dicumylperoxide or azo-compounds, such as azo-bis-iso-butyronitril, or and~~ photo-labile compounds ~~such as benzoyl-based radical starters~~, said radical starter ~~preferably~~ being heat- or radiation activatable.

25. (Previously Presented) A method of producing an IPN according to claim 1, wherein said monomer is dissolved in liquid solvent, said silicone polymer composition being

exposed to said solvent while the solvent is in liquid state, in gas state and/or supercritical state.

26. (Previously Presented) A method of producing an IPN according to claim 1, wherein said monomer is dissolved in gas solvent, said silicone polymer composition being exposed to said solvent while the solvent is in liquid state, in gas state and/or in supercritical state.

27. (Previously Presented) A method of producing an IPN according to claim 1, wherein said monomer is dissolved in supercritical solvent, said silicone polymer composition being exposed to said solvent while the solvent is in liquid state, in gas state and/or in supercritical state.

28. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition is exposed to said solvent for a sufficient time to swell the silicone polymer composition with at least 0.01 % ~~such as at least 0.1 %, such as at least 1 %~~ by weight of solvent calculated on the weight of the silicone polymer composition.

29. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition is exposed to said solvent under varying pressure, the pressure ~~preferably~~ being decreased after at least part of the solvent has been swelled into the silicone polymer composition whereby monomer(s) precipitate ~~with~~ within the silicone composition.

30. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition is exposed to said solvent under varying temperature, the temperature ~~preferably~~ being decreased after at least part of the solvent has been swelled into the silicone polymer composition whereby monomer(s) precipitate within the silicone composition.

31. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition is exposed to said solvent under conditions where the solvent is in a first state, followed by a change of conditions whereby the solvent changes to a second state, said first state ~~preferably~~ being liquid state or supercritical state and said second state ~~preferably~~ being gas state.

32. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition is exposed to said solvent with said one or more monomers for a sufficient time to precipitate at least 0.01 %, ~~such as least 0.1 %, such as at least 1 % by, such as up to about 50 %~~ by weight of monomer(s) of the total weight of the silicone polymer composition.

33. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition is exposed in two or more steps to said solvent with one or more monomers to provide at total monomer precipitation of at least 0.01 %, ~~such as at least 0.1 % such as at least 1 % by, such as up to about 50 %~~ by weight of monomer(s) of the total weight of the silicone polymer composition, said two or more steps being equal or different from each other ~~e.g.~~ with respect to solvent, monomer amounts and/or exposing time.

34. (Currently Amended) A method of producing an IPN according to claim 31, wherein said silicone polymer composition is exposed to said solvent with said one or more monomers for a total time of at least 1 min, ~~such as for 5 min, such as for 20 min or more.~~

35. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition is treated with the solvent in or near its supercritical state ~~(for extracting residues)~~ followed by feeding of the monomer into the reaction chamber where the monomer is dissolved in the solvent in or near its supercritical state while the silicone polymer composition simultaneously is exposed to the solvent.

36. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition is exposed to a solvent consisting essentially of carbon dioxide and carrying the monomer(s) in or near its supercritical state, for a sufficient time to swell the silicone polymer composition with the solvent ~~with~~ carrying the monomer(s).

37. (Currently Amended) A method of producing an IPN according to claim 1, wherein said silicone polymer composition prior to the exposing step is shaped, ~~preferably by~~ extrusion, injecting-moulding, calendaring, pressing or cutting.

38. (Currently Amended) A method of producing a polymeric unit ~~(for automotive or telecom use)~~ comprising the steps of:

-producing an IPN unit in ~~the~~ a desired shape by a method according to claim 1,

and

-treating the surface thereof, ~~e.g.~~ by plasma or flame surface activation and subsequent painting, or immediate painting or coating.

39. (Original) A method of producing a polymeric unit according to claim 38 wherein the silicon polymer composition used for the IPN is transparent.

40. (Currently Amended) A method of producing a polymer unit according to claim 38, wherein the one or more monomers comprise one or more monomers selected from the ~~group of~~ styrene, acrylics and ~~uethanes~~ urethanes.

41. (Currently Amended) A method of producing a polymer membrane comprising ~~the steps of:~~

-producing an IPN unit shaped as a membrane by a method according to claim 1, wherein the membrane has a thickness between 5 and 1000 μ m.

42. (Currently Amended) A method of producing a polymer membrane according to claim 41, wherein the amount of monomer precipitated into the silicone polymer composition is 5 % by weight or less, ~~such as 2% or less or such as 1% and less.~~

43. (Previously Presented) A method of producing a polymer membrane according to claim 41, wherein the membrane is a membrane for separation of gases or liquids.

44. (Currently Amended) A method of producing a polymer membrane according to claim 41, wherein the membrane is a fuel cell membrane, said membrane ~~preferably being~~ less permeable to gases than the original silicone composition at least by a factor of 2, and

whereby the conductivity for protons (H^+) ~~preferably~~ is increased in comparison with the original silicone composition by incorporation of proton-conducting monomers ~~such as imidazol or imidazol derivatives~~, the conductivity for protons (H^+) ~~preferably~~ being increased in comparison with the original silicone composition by a factor or at least 10, ~~such as at least 100~~.

45. (Currently Amended) An IPN ~~obtainable~~ obtained by a method according to claim 1.

46. (Original) An IPN according to claim 45 wherein the IPN is a full IPN comprising at least two interpenetrating, individually cross linked networks.

47. (Previously Presented) An IPN according to claim 45 wherein the IPN is essentially free of organic solvents.

48. (Currently Amended) An IPN according to claim 45 wherein the IPN comprises a network of ~~a polymer selected from the group consisting of~~ polyvinylpyrrolidone.

49. (Currently Amended) An automotive part comprising a polymeric unit ~~obtainable~~ obtained by a method according to claim 38.

50. (Currently Amended) A telecom part comprising a polymeric unit ~~obtainable~~ obtained by a method according to claim 38.

51. (Currently Amended) A medical device ~~such as selected from~~ catheter, part of a pace maker and an implant, comprising a polymeric unit obtainable obtained by a method according to claim 38.

52. (Currently Amended) A gas separation membrane comprising a polymer membrane obtainable obtained by a method according to claim 41.

53. (Currently Amended) A fuel cell membrane comprising a polymer membrane obtainable obtained by a method according to claim 41.